IN THE SPECIFICATION:

Paragraph beginning at line 7 of page 1 has been amended as follows:

So-called transparent defect correction for repairing defect sections of a mask used in semiconductor manufacturing processes, and so-called opaque defect correction for removing additional sections are carried out using technology such as deposition carried out by irradiating a focused ion beam (FIB) while spraying a source material gas, and sputter etching and gas assisted etching for irradiating a focused ion beam. Currently, this technology is established in the field of FIB mask repair. However, gallium, which is a liquid metal, is generally used as the ion material for this focused ion beam, and there is a problem that the sample surface is damaged by Ga ions irradiated In the course of processing. Accordingly, since at a coarse processing stage processing is carried out at a high acceleration voltage, a procedure is necessary to carefully perform finishing processing of a sample surface that has been subjected to ~~damaged~~ damage because of this high acceleration voltage with a low acceleration voltage at the finishing processIng stage, and polish the damaged sample surface. Although it is possible to repair the roughened sample surface using this

procedure, since gallium is used as the ion material, the gallium is injected into a mask, which is the sample, and this injected gallium remains in the finished mask. When this mask is used in lithography, the remaining gallium absorbs light and adversely affects transparency, and causes an imbalance in intensity of light irradiated to resist. Because the latest semiconductor patterns are becoming extremely detailed, it is necessary to use light of short wavelength as a light source in order to obtain a clear transfer image. The problem of this light absorption is therefore particularly serious when using light at a wavelength of 157 nm.

Paragraph beginning at line 4 of page 3 has been amended as follows:

In Fig. 6A, coherent light irradiated from above passes through each open section 44, and binds an image on the wafer either directly or via a lens optical system. Light passing through the phase shifter film 42 has light phase shifted by 180° compared to the light that has not passed through the phase shifter film. Amplitude distribution of light passing through the mask open sections is as shown in Fig. 6B. Specifically, light that has passed through open sections 44 in the phase shifter film 42 and light that has passed through open sections 44 that are not in the phase

shifter film 42 are 180° out of phase with each other. Also, since light that has passed through the open sections 44 is diffracted, diffracted light also reaches the wafer corresponding to sections in the shadow of the shaded pattern 62. Therefore, amplitude (strength) of light reaching the wafer is as shown in Fig, 6C. Light diffracted at shadow sections of a particular shaded pattern 62 and rotated from left and right open sections is 1800 out of phase with each other. That is, negating this, the strength distribution of light irradiated on the wafer becomes as shown in Fig. 6D. Specifically, an image of the open section is clearly separated. Also, besides the phase shifter film, there is also a method of forming a groove ~~45v~~ 45 in the glass substrate and causing phase shift, as shown in Fig. 6E.

Paragraph beginning at line 20 of page 8 has been amended as follows:

A mask correction method of the present invention carried out using the above device will now be described. First of all, in order to carry out observation of a correction region, an electron beam or a focused ion beam is scanned and a microscope image is acquired by detecting a secondary electron image using the detector 7. Defect sections are identified by image observation, and positioning

for the mask correction region is carried out. In particular, when it is desired to reduce damage due to imaging, positioning of the correction regions is carried out by ~~acquitting~~ acquiring an SEM image with an electron beam without using a focused ion beam. When a defect is a mask residual defect (opaque defect) 21 such as that shown in cross section in Fig. 2A, in order to remove the opaque defect 21, etching gas is sprayed and directed from the gas introduction device 8 to the defect region, and a focused ion beam is irradiated to the defect region. Then, as shown in Fig. 2B, irradiation of the focused ion beam is stopped with a small amount of residual material remaining, without completely removing the defect. This processing is gas assisted etching with liquid gallium as an ion source, which means that gallium is implanted into the remaining part of this opaque defect. Since there is part of the mask where light passes through, if the opaque defect is contaminated with gallium, then even if the opaque defect is removed there is light absorption at that part and there will be the above described problems in a lithographic process. In order to remove the opaque defect 24 remaining, as shown in Fig. 2C, etching gas (XeF_2) is sprayed to the remaining defect region, and as shown in Fig. 2D, this time an electron beam is irradiated to that region, and the defect section is removed completely. This processing is gas

assisted etching using an electron beam, which means that there is no injection of gallium into the sample, and the gallium that was implanted by the previous ion beam process is removed together with the residual opaque defect. This is the opaque defect correction method of the present invention.

Paragraph beginning at line 1 of page 10 has been amended as follows:

This photomask opaque defect correction is good for acquiring transparency of a glass substrate section, and with respect to thickness of a glass substrate, differing from the case of a phase shifter, which will be described later, there is no requirement for stringency. Bearing this point in mind, with this opaque defect correction, using FIB processing the thin layer of the remaining opaque defect 24 shown in Fig. 2C will be completely removed without leaving any behind, and even with a process for removing a gallium impregnation layer incidentally injected ~~inside~~ into the glass substrate using an electron beam, there is no particular problem. In that case, it is possible to terminate FIB processing by detecting that there is no longer any opaque defect using the ion type identification function of the secondary charged particle detector 7, and automatically switching to electron beam processing, which is extremely advantageous from the point of view of working capacity.

Paragraph beginning at line 15 of page 10 has been amended as follows:

Also, in the case where the observed defect is a mask void defect (transparent defect) 25, as shown in cross section in Fig. 3A, then in order to remove the transparent defect 25, CVD source ~~material,~~ material gas is sprayed to the defect region as shown in Fig. 3B, and a focused ion beam or an electron beam is irradiated to that region. In this way, the defect is corrected by forming a localized film by deposition using an ion beam or an electron beam. With a conventional mask in the case of a normal transparent defect, since there is a region where light is shielded, there is no problem due to light absorption even if liquid gallium is used in the ion source and gallium elements are implanted into the correction region. Accordingly, for transparent defects, it is possible to carry out correction using a focused ion beam.

Paragraph beginning at line 3 of page 11 has been amended as follows:

Next, a correction procedure when a sample is a phase shift mask will be described. Similarly to the previous case, first of all, in order to carry out observation of the correction region, an electron beam or a focused ion beam is scanned and a secondary electron image is detected by the

detector 7 to acquire a microscope image. Defect regions are identified using image observation and the mask correction regions are positioned. If damage to the phase shifter film 42 is taken into consideration, it is preferable to carry out observation with an SEM image using an electron beam. In the case where the observed defect 41 is a void defect in the phase shifter film 42 such as shown in cross section in Fig. 4A, in order to fill up and correct ~~that~~ the void defect 41, as shown in Fig. 4B, CVD gas (Silicon type gas such as TEOS) is sprayed to the defect region and an electron beam EB is irradiated to that region. In this way, it is possible to form a transparent film and to correct the phase shifter film 42. Since the phase shift film has a region that light passes through, in processIng at this time a focused ion beam that would cause a problem of gallium contamination is not used, and instead deposition is carried out using an electron beam.

Paragraph beginning at line 21 of page 11 has been amended as follows:

Also, Fig. 4C is a cross sectional drawing of a bump defect 43 on the phase shifter film 42 of a phase shift mask. This bump defect 43 is a redundant defect, basically the same as the opaque defect, and must be removed. In order to remove the bump defect, etching gas is sprayed and directed to the

defect region, as shown in Fig. 4D, and an electron beam or focused ion beam is irradiated to that region to remove it by gas assisted etching. As described previously, this phase shifter film 42 constitutes a region of a mask through which light passes, and therefore no light absorption problem arises if gallium remains. When correction is carried out by etching using an electron beam from the start, this gallium residue contamination problem does not arise. However, when removing a bump defect using gas assisted etching using a focused ion beam because the bump defect is large or the like, similarly to the case of the opaque defect, the bump defect is not completely removed and remains thinly. Gallium is implanted and injected into this thinly remaining defect section. Then, as finishing processing to remove this gallium contaminated section etching gas is sprayed to the defect region and an electron beam is irradiated to that region. It is possible to remove a damaged section caused by the ion beam irradiation and the bump defect region by this gas assisted etching using an electron beam.